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C.F.
35-50-1
LOW PRESSURES RESEARCH
College Avenue Pool

July 11, 1952

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Director
Office of Naval Research
Branch Office
1000 Geary Street
San Francisco 9, California

MONTHLY STATUS REPORT - JUNE 1952

Contract N7-onr-295-Task 3
Project Number NR 061-003

Dear Sir:

Progress on the contract for the month of June has been as follows:

1. A preliminary measurement of a reflected molecular beam was successfully recorded. The signal strength appears sufficient for the proposed reflection experiments. A minor amount of modification will be necessary to reduce the electrical noise level and to produce a clear signal. This work is under way.
2. Modification of the semi-adjustable diffuser is continuing (item 2 of the May status report). Future tests are planned to evaluate the modified equipment.
3. Evaluation tests of the No. 8 nozzle ($M = 4.0$ ideal) have been completed. The results of this investigation will be presented in the form of an appendix to the report describing the design of this nozzle.
4. An investigation of the performance of an ion pulse true velocity measurement system was carried out in June using the No. 3 Wind Tunnel. This program is sponsored by the National Advisory Committee for Aeronautics.
5. The following report was issued in June:

HR-150-91: "Heat Transfer from Right Circular Cones to a Rarefied Gas in Supersonic Flow" by R. E. Drake, Jr., and G. J. Maslach.

Abstract: This report describes an experimental investigation of heat transfer from right circular cones to a rarefied gas in supersonic flow ($2.16 < M < 3.54$) and at low Reynolds numbers ($76 < Re < 3270$) in the slip flow region. The heat transfer coefficient, h_w , is shown to be a linear function of the parameter \sqrt{Re}/M over the range investigated. Overall free stream recovery factors exhibit the same sharp increase as the gas is rarefied, as has been observed earlier in the case of spheres.

6. Mr. H. A. Mahan presented a paper at the I.S.A. student meeting in Los Angeles. The subject was "Skin Friction of a Flat Plate in Rarefied Gas Flow."
7. Mr. H. A. Mahan addressed a special seminar at the California Institute of Technology on June 25, 1952. The subject of the lecture was "The Differential Equations of Rarefied Gas Dynamics."
8. Visitors The following persons visited the project during the months:
- W. P. Gerda - University of Illinois
 - Mr. W. W. Wadsworth - Institute of Numerical Analysis, Univ. of Calif., Los Angeles, Calif.
 - Edwin Mayman - NACA, Los Angeles, Calif.
 - Robert M. Street - University of Washington, Washington, D. C.

Future progress reports to be issued under the above contract will be submitted by Professor S. A. Schaaf, the Faculty Investigator supervising the investigations.

Very truly yours,

S. A. Schaaf

S. A. Schaaf,
Faculty Investigator

SAS/bp

cc - ONR S.F. (1), ONR WASH. (3)
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